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may also be used as a work of reference. For this purpose a great many more names have been included in the index than are named on the maps, their position being given by latitude and longitude.

The atlas is certainly of great value, and marks a new departure in the teaching of geography in higher schools. While we acknowledge the full importance of the work as a whole, we have to remark on a few minor points. The first of these is the lack of uniformity in the use of colors. Thus the author designates depressions by approximately the same color which is used for land between 500 and 1,000 feet on other maps. Furthermore, we miss throughout a uniformity of treatment of the depths of sea. In the contour-line maps of England, Ireland, and Scotland, the hundred-fathom line only is indicated, no additional details being given to the map of western Europe. It is the object of lines of equal depth to continue the representation of the earth's surface under the level of the water; therefore lines of height and of depth must be given in equal detail. The same applies to the other maps of the atlas. Map 3, illustrating methods of hill-drawing, is evidently an imitation of the corresponding map of "Sydow-Wagner's Atlas"; but it compares very unfavorably with it, the hachures in the various engravings of the same region not representing the same slopes and even configuration. An appendix contains a great number of typical views of landscapes, towns, products, and human races.

AMONG THE PUBLISHERS.

A DESPATCH from the City of Mexico reports that Adolph Sutro, of Comstock Mine and Sutro Tunnel fame, who is travelling in South America, bought in an old bookstall in that city what is claimed to be a genuine copy of the first folio edition of Shakspeare for an insignificant price.

— Messrs. Cassell & Co. will publish at once a new edition of William Robertson's "Life and Times of the Right Hon. John Bright," which has been brought down to date by a well-known American writer. The adding of the last lines to these chapters has been held back to await the death, which has been for so long anticipated. Mr. Robertson had especial advantages for writing this life of the great reformer and statesman, and it reads with all the absorbing interest that attaches to the well-written biography of a great man. The frontispiece of the book is a portrait of Mr. Bright taken from a recent photograph. A few proof impressions on India paper, suitable for framing, of the etching from the famous Ouless portrait of John Bright, are offered for sale by Messrs. Cassell & Co. The original painting is owned by the Manchester Reform Club, by whose kind permission it was etched.

— Harper & Brothers will publish in May the second volume of Justin McCarthy's "History of the Four Georges."

— J. B. Lippincott Co. have nearly ready an anonymous story entitled "John Charáxes." Some who have seen the work think that its familiarity with Boston society, traditions, etc., the peculiar religious and political views occasionally expressed, and the scholarly style, point to the eminent lawyer, George Ticknor Curtis. This accords with certain rumors which have recently been afloat regarding his intention to write a novel bearing somewhat on the questions culminating in the civil war.

— Houghton, Mifflin, & Co. will publish next week Miss Howard's novel, "The Open Door;" an important religious work by Professor J. F. Weir of Yale, entitled "The Way: the Nature and Means of Revelation," a thoughtful book of the "New Theology;" "Prolegomena and an Index to *In Memoriam*," a book of notes on Tennyson's great poem; and a new edition of the reliable "Satchel Guide to Europe," carefully revised and printed from wholly new plates. They bring to the attention of the trade and the public Dr. Holmes's admirable memoir of J. L. Motley.

— Charles Scribner's Sons have just ready the second volume of Dr. M. R. Vincent's "Word Studies in the New Testament," treating of the writings of John. The purpose of the author of this work is to enable the English reader and student of the New Testament and of the Bible to get at the original force, meaning, and color of the significant words and phrases as used by the dif-

ferent writers. They have also just issued a volume of musical essays entitled "Chopin, and Other Musical Essays," by Henry T. Finck, author of "Romantic Love and Personal Beauty," who in this volume discusses such timely questions as German opera in New York, and the differences between the German and Italian vocal styles, as well as Chopin, Schumann, and the philosophical relation between music and morals. They will publish shortly J. A. Froude's new historical novel, to be entitled "The Chiefs of Dunboy." The period is the middle of the last century, and the characters include Irish exiles who have taken refuge and acquired influence in France, which they use as a base of supplies in their intermittent warfare against England. It will be issued in cloth and in paper bindings simultaneously with its appearance in England, being the first volume which the Scribners have issued for some time among their yellow-cover paper novels.

— The March number (No. 41) of the Riverside Literature Series (published monthly at 15 cents a number by Houghton, Mifflin, & Co., Boston) contains "The Tent on the Beach," and other poems, by John Greenleaf Whittier, with notes especially arranged for this edition. "The Tent on the Beach" tells of a summer holiday, spent by Whittier and his friends Bayard Taylor and James T. Fields; and in the poem, which by many is considered one of Whittier's best, some characteristics of these writers are very interestingly described. The other poems, among which may be mentioned "The Wreck of the Rivermouth," "The Grave by the Lake," "The Maids of Attitash," and "Abraham Davenport," are principally

"Legends and runes
Of credulous days, old fancies that have lain
Silent from boyhood taking voice again,
Warmed into life once more, even as the tunes,
That, frozen in the fabled hunting horn,
Thawed into sound."

— A group of articles on fishing will begin in *Scribner's* for May, with a paper on "The Land of the Winanishe," by Dr. Leroy M. Yale of New York, and J. G. Aylwin Creighton of Quebec, who will describe a fishing-trip to Lake St. John after land-locked salmon. This region was recently made accessible to sportsmen by a new railway. Eugene Schuyler will publish in the same number some reminiscences of "Count Leo Tolstoi Twenty Years Ago." Mr. Schuyler was a visitor at Tolstoi's home, and had many long and intimate conversations with him, which are now for the first time published. The recollections will be concluded in the June number. Charles Eliot Norton of Harvard will contribute the end paper, the subject being "The Lack of Old Homes in America," and the associations and sentiments of which we are thereby deprived.

— T. Y. Crowell & Co. will publish at once a new edition, in paper covers, of "My Religion," by Count L. N. Tolstoi. This book, which was the first to attract attention to Count Tolstoi's remarkable personality, immediately caused more discussion than any other work of its kind that has been published since "Ecce Homo."

— The editor and publisher of the *International Ethnographic Archive*, not content with publishing yearly six magnificently illustrated and printed numbers, propose to issue supplements as occasion may offer. The first of these contains a learned description of the Indians of Guatemala, by Dr. Otto Stoll, whose studies on that country have won him so well deserved renown. The author treats fully, on the ground of his extensive observations and studies of literature, the social organization, religion, the practices of war, technology, and trade of the ancient inhabitants. The chapter on technology is admirably illustrated by two chromolithographs. The author describes the division of land among the gentes, — the chinamit, — the laws of marriage, terms of relationship, government, and the social position of the common men and of slaves. The chapter on religion is a very clear and succinct representation of what is known on this important subject, the famous Popol Vuh receiving its due attention. Psychologists will be particularly interested in the chapter on "Suggestion and Hypnotism," which phenomena are so widely spread among primitive people, but have not yet received their proper share of attention.

— The recent volume of the *Meddeleiser om Groenland* contains two papers of great importance, which shed an entirely new light upon several ethnological questions referring to the Eskimo. The first of these papers is a collection of tales and traditions from Angmagsalik, on the east coast of Greenland, where the Danish expedition under Capt. G. Holm spent a whole winter; the second is a discussion of the vocabulary collected at this place by Dr. H. Rink. The tales are very much of the same character as those collected in other parts of Arctic America. Some of them are identical with tales from West Greenland and Labrador, while others are mainly new combinations of parts of well-known tales. The vocabulary is particularly interesting, on account of the great number of new terms for the most common objects. Most of these terms are descriptive names, the word which is used in all other dialects having become extinct. Thus, instead of "berry," the East-Greenlanders say "that what is picked;" instead of "hand," "limb;" for "tail," "end;" instead of "mother," "origin;" and many others. Similar words are used by the Eskimo shamans of other regions, but this is the only place where they have to a great extent superseded the common words. A great number of these words may have come into use, when, after the death of a man, people avoided mentioning him and his property; but others may simply have been taken from tales, and adopted for ordinary use. It is remarkable, that, in consequence of this custom, the East Greenland dialect has many features by which it differs from all other dialects. This fact must be considered a proof of a long isolation of this tribe.

— Fred H. Whipple, Detroit, Mich., will issue in June a complete directory of the electrical fraternity, including every person in every branch of the trade, and proposes to supplement this monthly, until the next annual number, with commercial reports embracing the doings of the electrical world up to date. These reports will be in the nature of confidential bulletins on the progress of the business world, confined entirely to matters electric, and will be sent only to annual subscribers.

— It is stated that throughout Asia Minor there are splendid opportunities for the introduction of machinery, the field at present being entirely unoccupied. There is a great abundance of water-power in the country, although at present it can hardly be said to be utilized. According to *The Timber Trade Journal*, there is not a board of any sort, or even a plank or beam, ever sawed there by any other power but that of the human hands: there is therefore a good opening for wood-working machinery. There ought also certainly to be an opportunity for agricultural-implement makers to introduce their products into Asia Minor, as such implements as are at present in use there are of the most primitive description. The spades and shovels are made of wood, each being cut out of one solid piece of timber. The ploughs are also of wood. Indeed, such implements cannot be called "ploughs" at all, as they are only pointed sticks, which comparatively seldom have even an iron-pointed cap upon the point which scratches, and it is supposed to turn over the soil. Manchester supplies most or perhaps all the cotton prints which are imported, and great quantities of which are used for clothing, divans, bedding, and such like purposes.

— Messrs. Kelso & Co., Glasgow, we learn from *Engineering*, have just completed the construction of the dynamometric apparatus in connection with the experimental tank being built at Spezzia for the Italian Government. This tank is similar in general details to that constructed by the British Government at Gosport, and by Messrs. William Denny & Brothers at Dumbarton, on the principle of Dr. Froude. The experimental tank at Spezzia is 500 feet in length, which is 100 feet more than that at Gosport, and the breadth is about 22 feet. The use of the tank is to determine the form of ship which shall have the least possible resistance at a certain speed, conforming to practical considerations, and to ascertain the relation of power to speed with the form of ship under consideration. The model having been constructed of paraffine, and faired by a specially designed machine, is tried in the tank by means of a dynamometric apparatus to measure the resistance of the models at varying speeds corresponding to the required speeds

for the full-sized ship. The apparatus is mounted on a carriage, which also supports the arrangement for measuring the rise and fall of the bow and stern of the model in its progress through the water. The chief novelty lies in the framework. The rails or platform on which the apparatus runs at Messrs. Denny's tank, are suspended by means of tie-rods from the joists of the tank; whereas at the new Italian tank the rails are placed at either side of the tank, which allows of the framework being so constructed as to afford an unobstructed view of the whole water behind, with the waves and currents. For accurately recording on a revolving cylinder the speed at which the model is running, electric arrangements have been supplied, the current being from a battery of Leclanché cells, carried on the lower table of the resistance truck. The circumferential travel of the cylinder is a function of the speed of the carriage supporting it, and on it is also recorded the resistance diagram, which is obtained by the extension of a helical spring attached to the dynamometer. There is an automatic arrangement for lifting and lowering the pens on the diagram and revolving cylinders. It may be added that the dynamometer of Messrs. Denny's tank was also supplied by Messrs. Kelso from plans by Mr. Froude.

— According to a parliamentary paper, entitled "Statement exhibiting the Moral and Material Progress and Condition of India," an abstract of which appears in the *Journal of the Society of Arts*, London, progress in education continues in India. The number of schools and colleges rose in 1887 to 127,381, as compared with 122,643 in the year 1886, and the total number of scholars to 3,358,042, as compared with 3,339,061. Of this total, only about 150,000 were girls; but the increase in the number of girl scholars has, during the last three years, been in a much larger ratio than the increase among the boy scholars. A new university was opened at Allahabad in 1887, and India now possesses five universities, all of which hold examinations and grant degrees. The number of candidates for admission to the universities rose from 13,254 in 1886, to 14,732 in 1887, and the number of admissions from 4,231 to 6,224. The number of students who gained university degrees in 1887 were 826 in art and science, 80 in medicine, 37 in engineering, and 193 in law. A large number of medical students obtained diplomas as hospital assistants in 1887, besides those who graduated in medicine. Of the Calcutta graduates in arts during 1887, two were women. The number of secondary or higher schools for boys has risen during the last five years from 3,932 with 215,731 pupils, to 4,160 with 404,189 pupils: during the same period the secondary schools for girls have risen from 190 with 6,366 pupils, to 357 with 24,904 pupils. The most important technical schools are the workshops at the great railways, at which some hundreds of apprentices, many of them holding scholarships or stipends from government or from local bodies, are learning mechanical engineering, smithy work, and carpentry. The number of pupils at engineering colleges and at art schools is very small, but the teaching of drawing and of surgery is being extended in most provinces. Now that primary and secondary schools are mostly under the control of municipal and local bodies, it is expected that technical teaching in the special handicraft or manufacture of each locality will be gradually increased.

— The American Statistical Association possesses a statistical library, the result of forty years' collection, which is designed as a depository for statistical works of every nature. At present the library is placed in rooms 31-33, Rogers Building, Massachusetts Institute of Technology, Boston. Its collection embraces not only the publications of the United States, but also many valuable reports issued by statistical bureaus of foreign countries. It also includes the very valuable statistical library collected by the former president, Dr. Jarvis, and bequeathed to the association upon his death, in 1884. It is believed that the collection and preservation of reports which admit of a classification according to statistical groupings, will be of great public service, and the association earnestly requests a generous co-operation in still further enlarging the library in such directions. Reports of vital and social statistics, registration reports, census documents, municipal reports, documents relating to public works, reports of trade, commerce, taxation, finance, insurance, industry, labor, health, crime, education, and religion, are especially desired.

— The *Quarterly Journal of Economics* for April opens with an article by F. W. Taussig, on "Some Aspects of the Tariff Question," in which the writer considers what effect the protective tariff has had in establishing, or helping to establish, certain industries. He shows that some branches of manufacture, such as that of silk goods, for instance, have been strongly stimulated by it; while other industries, among which the culture of flax fibre is conspicuous, have utterly failed, notwithstanding the high duty on the imported articles. Professor Taussig's conclusion is that international trade is really controlled, as the economists have always held, by the comparative cost of different commodities. Mr. Philip H. Wicksteed discusses "Certain Passages in Jevons's 'Theory of Political Economy,'" criticising some of Jevons's views, while agreeing with him as to the use of the mathematical method. The next article is on "Co-operative Savings and Loan Associations," by Seymour Dexter, and is mainly a description of such societies, which the author regards as one of the best forms of co-operation. He points out, however, that they have nowhere had very marked success except in Pennsylvania,—a fact which he attributes to certain superiorities in the laws of that State. Mr. James Bonar gives an abstract of a new theory of capital, recently advanced by the Austrian economist, Böhm-Bawerk. The problem is to account for interest, and the Austrian professor holds that it arises from the fact that future goods are not really so valuable as present goods otherwise identical. A dollar that I am to receive a year hence is not so valuable to me as a dollar in my pocket now; and therefore, if a man loans his capital, say for a year, he will demand at the end of that time not only the full value of his capital, but also an additional bonus, called interest. This theory is put forward as a new one; but we cannot see that it differs essentially from that of the English economists. They have always held that if a man loaned his wealth, or used it in production, so that he had to wait for its value to be returned to him, he would demand a recompense for waiting; and Professor Böhm-Bawerk's theory, as stated by Mr. Bonar, seems to be only a new expression of the same principle. The journal closes with the second part of Mr. A. B. Houghton's essay on "Italian Finances from 1860 to 1884,"—a paper containing a great amount of historical and statistical matter which will doubtless be useful to special students.

— A writer in the *Fortnightly Review* for March, speaking of the character of the Boers, says that it is considered perfectly correct to "do" the Boers. In the first place, money was perfectly useless to them, as they only keep it in gold in chests inside their bedrooms, and are constantly uneasy about it; second, the sons were only led into drinking and bad habits by having ready cash; and, lastly, it was impossible sometimes to deal with them otherwise. As an instance, there is a case where a Boer farmer asked for his farm, upon which gold had been discovered, the exorbitant sum of £50,000. If the buyer had refused, the obstinate man would never have abated the price; so he said he must think it over. Shortly afterwards he went to the bank and took out £6,000 in half-sovereigns, in twelve bags of £500 each. He drove up with these to the farmer's house, and took out ten of the bags, and said, "I have come to buy the farm."—"Have you brought £50,000?" said the farmer. "Well," said the Jew, "I have brought a lot of money; I will put it on the table." He then poured out the £5,000 in half-sovereigns. The farmer and his vrouw looked on, and their eyes glistened as they looked at the table covered with gold. "How much is there?" said the vrouw. "You had better count it," said the Jew. Of course, that was impossible; so the vrouw said, "Could you not give us some more bags?"—"Well," said the Jew, "I must see if I have any more." Then he told the boy to bring one bag out, and he purchased the farm for £5,500.

— Messrs. Putnam have issued "Virgil's *Aeneid*, the First Six Books," translated into English rhyme by Henry Hamilton. The narrative parts of the poem are in the ten-syllable couplet, and the speeches in a great variety of verse, changing with each recurring speaker. The object of this frequent change of form is to give variety to the English work; but as the original is all in one metre, and that radically different from any employed by Mr. Hamilton, there is nothing in the versification to remind us of Virgil. The

author complains that Conington's translation "by no means reproduces the sonorous effect of the Latin hexameter; but in what respect his own does so, we are unable to see. With several translations already in the field, we can see no good reason for a new one, unless it is fitted to supersede the others, which we fear is not the case with Mr. Hamilton's."

— What is claimed to be Miss M. G. McClelland's strongest story will be published by Cassell & Co. within a few days. It is called "Burkett's Lock." It is a story of the home; and as a picture it is believed that "Burkett's Lock" will make a sensation among the novel-reading public that they have not experienced in a long time, for it has a story in it, and a story well told. The scene is laid in Virginia, where Miss McClelland is so thoroughly at home, and her characters are drawn from the people, who are native to the soil.

— According to statistics published in *The Publishers' Weekly*, the following is an estimate of the new books published in Russia in 1888: philosophy, 26; education, 86; philology, 420; fiction, 818; geographical works, 211; history, 413; political science, 368; mathematics, 153; military, 202; natural sciences, 168; medical, 454; technological literature, 127; domestic economy, farming, etc., 121; books for children, 115; books for the people, 217; fine art, 139; miscellaneous, 448; total, 4,486. This does not include the literature published under ecclesiastical censorship, which naturally comprises theological books; nor are the books accounted for which did not circulate through trade mediums. It may therefore be assumed that the total number of books issued amounts in round numbers to five thousand volumes.

— The general outcome of a paper on "The Viscous Effect of Strains Mechanically applied, as interpreted by Maxwell's Theory," published by C. Barus in the *Philosophical Magazine* for February, is this: that the effect of strain of whatever kind, applied in sufficient intensity to homogeneous soft steel, is marked diminution of viscosity. Again, inasmuch as the underlying cause of viscous deformation is the occurrence of unstable configurations, the number of which is being reduced in the course of viscous motion, Maxwell's theory naturally suggests the applicability of exponential equations for the description of the time relations of such motion. From another point of view, it appears that the loss of viscosity experienced by a given metal, under action of a given kind of strain, may not appropriately be used as a measure of its intensity. Finally, the curious observation, that, in all the cases given, loss of viscosity has taken place simultaneously with increase of hardness, is one of the suggestive results of the experiments made.

— W. J. Campbell, Philadelphia, will publish early in May a new improved edition of "Grant's Pennsylvania Reports," in three volumes.

— The Rev. John George Wood, the well-known naturalist, died recently in England. The deceased did perhaps more to popularize the study of natural history than any writer of the present age. He was the son of a surgeon who was at one time chemical lecturer at the Middlesex Hospital, London. He was born in London in 1827, and was educated at Oxford. His most important book was his "Natural History," in three volumes. Mr. Wood edited for some time the *The Boys' Own Magazine*, the pages of which periodical constantly contained work from his hands. He left no fortune, and a popular subscription in aid of his family has been started.

— "The Emperor of China," says the *Athenaeum*, "has just issued orders for the preparation of a history of the Mohammedan rebellions in Yunnan, Kansuh, Shensi, and Turkestan, and five members of the Grand Council have been named as the committee to whom the work is intrusted. Similar official histories have already been written of the Taeping and Nienfei revolts."

— The Liege Chamber of Commerce has recently set an example, says the *Journal de la Chambre de Commerce de Constantinople*, which might well be followed by other industrial centres. It has established a commercial museum on an entirely new system. This museum is divided into two sections. The first comprises the articles that Belgium is obliged to purchase from other

countries, while the second contains samples of all the articles which are manufactured in Belgium. A library and an information bureau are attached to this museum.

LETTERS TO THE EDITOR.

* * * Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.

The editor will be glad to publish any queries consonant with the character of the journal.

Twenty copies of the number containing his communication will be furnished free to any correspondent on request.

The Robinson Anemometer.

So long as the anemometer law is purely empirical, it is doubtless largely a matter of individual taste that one should prefer to use a series of ratios whose values, even within the limits of ordinary usage, range between infinity on one hand, and 2.89 on the other,—a value which corresponds, according to *Science* of March 22 (p. 227), to a wind-movement of 25 miles per hour. Nevertheless occasion may be taken at some future time to point out a possible error into which one is easily led by use of this variable factor.

It seems, my "explanation of the effect of a uniform wind blowing across a whirler upon which an anemometer is being tested is very surprising;" indeed, I have wondered myself that so simple an explanation had not been suggested long ago. That it is "entirely untenable" cannot be admitted, since it is only made to appear so by my critic, who unfortunately omits from the very heart of the statement whose accuracy he questions, three very important words. Nothing more than this need be said. I am well aware, also, that "it has generally been considered that while these cups [of the anemometer] never respond instantly to the wind, and continually lag behind while the wind is rising, yet their momentum keeps them up, and about counterbalances this lagging while the wind dies down;" but that these effects about balance is exactly what does not occur, and therein is the novelty of the explanation I have suggested.

The substitute offered in *Science* of April 5 (p. 268) is based partly on an incorrect statement; namely, that a wind blowing directly at right angles to the path along which an anemometer is being carried will add its effect to that due to the motion of the anemometer. If the writer means that the sum of the two separate effects are to be taken, he is entirely wrong. It is a simple question of the resultant of two forces at right angles to each other, which is not the sum of the two separate forces. With this as a partial basis, the explanation is developed, and the astonishing conclusion reached that "the anemometer will be accelerated during more than three-fourths of the rotation [presumably of the whirler], and retarded during less than one-fourth of it." Had the author, in accordance with the principle of the parallelogram of forces, found the resultant of the two wind effects that act simultaneously upon the anemometer at each point of its path, and integrated or summed these up for a complete revolution of the whirler, he would doubtless have arrived at a much more accurate conclusion,—a conclusion that the ultimate resultant effect for a whole revolution "is only small in most cases, and is not very serious," as given in my original letter in *Science* of March 29; a view, moreover, that is entertained by Professors Dines, Stokes, and others who happen to have written on the question.

Even admitting that the explanation under discussion is correct, it does not account for the uniformity of the results obtained in England with the helicoid anemometer, which, being provided with a vane or tail, always presented its front directly to the resultant wind. The Robinson anemometer, from its construction, has no need of a tail, and the two instruments are circumstanced exactly alike so far as being equally subject to the resultant wind. It is presumed throughout this and previous papers that the axis of the Robinson anemometer is vertical or nearly at right angles to the plane of rotation of the whirler. The analysis of the problem is a little different when the axis is inclined more or less to the vertical, but the final result is practically the same.

Having several weeks ago submitted a paper containing in detail the various experiments and results that led to the development of

the explanation given in *Science* of March 29, I do not desire to cite here any experimental confirmation of the theory, nor do I consider that the results given by Professor Hazen in any way disprove the theory. Why one should expect to be able to use the same formula for cone-shaped paper cups as had been found applicable to hemispherical metal cups, or should be surprised at a difference of twenty per cent less wind-velocity, does not appear.

Following the example of Professor Hazen, I intend to try some experiments with hemispherical paper cups, and have thus far completed a set; but the pressure of other duties has not afforded me opportunity to do more as yet.

C. F. MARVIN.

Washington, D.C., April 8.

The Metric System and Professional Teaching.

THE committee appointed at the Cleveland meeting to consider the relations of chemistry to public instruction, naturally have their attention called to the metric system of measures. No doubt the familiarity of the public with this system has much increased since 1866, when the Act of Congress was passed making it legal; but recent conversations with parties who might be supposed well posted on the subject show some views that appear to the writer incorrect, and adapted to retard the adoption of a much-needed reform.

A very prominent teacher of chemistry said he was not an advocate of its general use, and that no time would be saved in the instruction of children by such adoption. The Metric Bureau, in their leaflet, stated that "a year of the school-life of every child would be saved by the adoption of this system." This statement was made by teachers. I do not know its basis; but there are, in the English system of tables we use, about fifty factors to be memorized. As there is but one factor in the metric system, and that the same as our system of numeration, necessarily fifty times as much time is required to learn English measures as metric. If the Society for Psychical Research can tell us the average time required to memorize an idea, we should then know the saving of time in instruction, that would follow the adoption of the metric system.

An apothecary assured me that the adoption of parts by weight in the new pharmacopœia, with which he connected in some way the metric system, had, in his judgment, done great harm to the drug business: for, he said, the wholesale manufacturers put on the outside of their bottles that one part of this extract, etc., with nine parts distilled water (or required proportions), would make ten volumes of the officinal strength. The extreme simplicity of this process, my friend argued, reduced the drug business, so far as intellectual qualifications are concerned, below the grocer, and the metric system was somehow held responsible.

The metric system is in universal use by chemists. The arts of medicine and pharmacy are dependent on chemistry for their materials and their processes. As matters now stand, every student in the colleges of these arts is obliged to learn two new tables of measures,—apothecary and metric; for I assume that all professors of chemistry teach the metric, and some professors of *materia medica* also. In other schools the chair of chemistry teaches one, and the chair of *materia medica* the other system.

Is it not time to inquire if this is a rational condition of things? It will not do to say the apothecary weight is learned in the primary school. The metric is taught also, at the present time. Both are usually forgotten before the student matriculates. Neither can it be said that we break away from the system of our English cousins, for our fluid measures are not the same as theirs, now that they use the imperial gallon. There remains the single argument against the metric system in our professional schools, that it is not in general use by physicians. Those who do use it find the gram a most convenient unit. The difficulty of inducing a large body of men to change some of their basic elements of thought seems to be the greatest obstacle to a beneficial improvement.

Now, why not let the old doctors use the old system, but teach the graduates only the new; then add to the pharmacy laws a clause requiring every druggist to provide himself with a set of metric weights, making this condition as indispensable as a diploma? At present, when a prescription is presented in the met-